Component 1: Construction Technology – sample mark scheme

General marking guidance

- All learners must receive the same treatment. Examiners must mark the first learner in exactly the same way as they mark the last.
- Mark grids should be applied positively. Learners must be rewarded for what they have shown they can do rather than be penalised for omissions.
- Examiners should mark according to the mark grid, not according to their perception of where the grade boundaries may lie.
- All marks on the mark grid should be used appropriately.
- All the marks on the mark grid are designed to be awarded. Examiners should always award full marks if deserved. Examiners should also be prepared to award zero marks if the learner's response is not rewardable according to the mark grid.
- Where judgement is required, a mark grid will provide the principles by which marks will be awarded.
- When examiners are in doubt regarding the application of the mark grid to a learner's response, a senior examiner should be consulted.

Points-Based Mark Scheme Guidance

Points-based mark schemes are made up of:

1. Mark scheme rubric:

   A mark scheme rubric instructs an examiner as to how each mark is awarded.
2. Example responses:

   These demonstrate the type of acceptable responses that a learner might provide and where each mark is awarded.
3. Additional marking guidance:

   This informs examiners about any parameters which should be applied, for example 'accept any other appropriate/alternative responses'.

Applying the points-based mark scheme guidance

Examiners should follow the mark scheme rubric and use the example responses as a guide for the relevance and expectation of the responses. Learners must be credited for any appropriate response. Should learners provide answers that meet the rubric but in an alternative order, credit should be given.

Levels-Based Mark Scheme Guidance

Levels-based mark schemes (LBMS) have been designed to assess learners' work holistically. They consist of two parts:

1. Indicative content:

   Indicative content reflects content-related points that a learner might make but is not an exhaustive list. Nor is it a model answer. Learners may make some or none of the points included in the indicative content as its purpose is as a guide for the relevance and expectation of the responses. Learners must be credited for any appropriate response.

2. Levels-based descriptors:

   Each level is made up of a number of traits which when combined together articulate the quality of response that a learner needs to demonstrate. The traits progress across the levels to demonstrate the different expectations of each level. When using a levels-based mark scheme, the 'best fit' approach should be used.

Applying the levels-based descriptors

Examiners should take a 'best fit' approach to determining the mark.

- Examiners should first make a holistic judgement on which level most closely matches the learner's response. Learners will be placed in the level that best describes their answer. Answers can display characteristics from more than one level, and where this happens markers must use any additional guidance (for example weighting of traits) and their professional judgement to decide which level is most appropriate.
- The mark awarded within the level will be decided based on the quality of the answer and will be modified according to how securely all traits are displayed at that level:
  - marks will be awarded at the top of that level if the learner has evidenced each of the descriptor traits securely.
  - where the response does not securely meet all traits, the marks should be awarded based on how closely the descriptor has been met.

Question Number	Answer	Mark
1	Award **one** mark for the correct response. **B** – Sprinkler systems	(1)

Question Number	Answer	Mark
2	Award **one** mark for each correct response, up to a maximum of two marks. **A** – Straw **E** – Timber	(2)

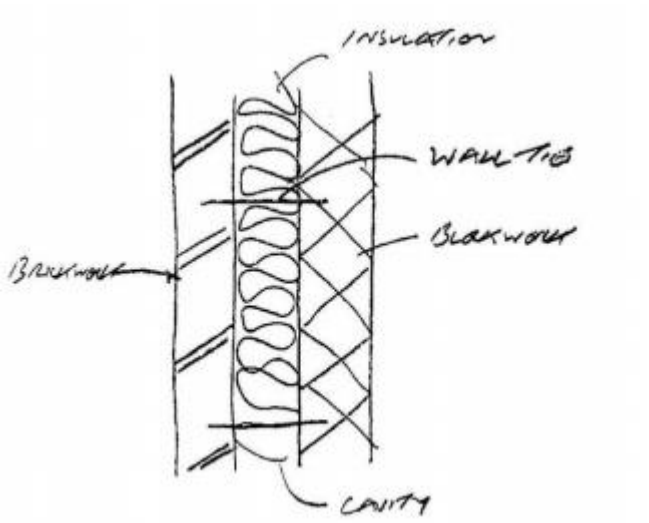
Question Number	Answer	Mark
3	Award **one** mark for each correctly matched line up to a maximum of **two** marks: Acoustic panels – Sound insulation Intumescent paint – Fire resistance	(2)

Question Number	Answer	Mark
4	Award **one** mark for any of the following up to a maximum of **two** marks. • To provide an acceptable U-value • To prevent loss of heat through gaps within a building or structure • To prevent the entry of cold air into a building Accept any other appropriate response.	(2)

Question Number	Answer	Mark
5	Award **one** mark for each stated type of residential construction form up to a maximum of **two** marks from: • Private housing • Apartments (flats) • Sheltered housing • Social housing Accept any other appropriate response.	(2)

Question Number	Answer	Mark
6	Award **one** mark for each correctly stated type of earthwork support which may be used in the excavation of a trench, up to a maximum of **two** marks. • Steel trench sheets • Timbering • Hydraulic trench supports • Sheet piling • Trench box Accept any other appropriate response.	(2)

Question Number	Answer	Mark
7	Award **one** mark for each correct label, up to a maximum of **four** marks. (i) Screed (ii) Damp proof membrane/PVC/Bitumen (iii) Concrete (iv) Hardcore/stone/MOT type 1/crusher run Accept any other appropriate response.	(4)

Question Number	Answer	Mark
8	Award **one** mark for each correctly placed and labelled component up to a maximum of **four** marks. Can be any four out of the following five: • Brickwork • Wall-tie • Blockwork • Insulation • Internal wall finish e.g dry lining, plasterboard Example of an acceptable sketch with appropriate labelling:  	(4)

Question Number	Answer	Mark
9	Award **one** mark for a correct advantage and **one** mark for a justification of why pitch roof construction is advantageous, up to a maximum of **two** marks. • Better water run off (1) reduces the risk of damage to the roof/leaks (1) • Aesthetics (1) tiling can be in various forms/colours which can both match and contrast with the surrounding buildings and give it an attractive look (1) • Less maintenance required (1) less prone to water damage compared to flat roofs (1) • Creates an opportunity for potentially floor space (1) allows for storage/loft conversions (1) Accept any other appropriate response.	(2)

Question Number	Answer	Mark
10	Award **one** mark for each correct disadvantage of tile hanging construction, and **one** mark for a justification, up to a maximum of **four** marks. • Easily damaged (1) as are prone to wind damage/low level tiles may be hit and damaged/during maintenance activities (1) • Requires more complex detailing (1) around openings (1) • Risk of injury (1) people can get injured from falling tiles (1) • May require greater maintenance (1) due to tiles potentially being less durable (1) Accept any other appropriate response.	(4)

Question Number	Answer	Mark
11	Responses will be credited according to the learner's demonstration of knowledge and understanding of the material, using the indicative content and level descriptors below. The indicative content that follows is not prescriptive. Responses may cover some or all indicative content, but learners should be rewarded for other relevant responses. **Indicative content**: Building on the greenfield site allows the following advantages: • The site may provide maximum design flexibility to meet the project/developers requirements. • Lower design costs due to greater flexibility of design on a green site. • Potentially lower costs for the developer as services may not need to be diverted etc. • More attractive to buyers as located in a green area. • No clean-up costs or constraints from previous buildings/sites. • May be less planning constraints. • Green space and the wooded area/lake could be partly retained with existing biodiversity. • The lake could be retained for recreational use by the local residents / occupiers of the new housing. Disadvantages of building on the greenfield site: • Damage to the natural environment. • Planning approval may take longer if local groups challenge the development. • Need to develop infrastructure and resulting costs. • Protected species-if found on the location may incur costs and time to relocate/protect. • Loss of view/scenery/visual intrusion. • Destroying habitats. • Presence of a lake could indicate a high water table and potential flooding issues.	(6)

Level	Mark	Descriptor
Level 0	0	• No rewardable content
Level 1	1–2	• Demonstrates isolated knowledge and understanding, there will be major gaps or omissions • Few of the points made will be relevant to the context in the question • Limited discussion which contains generic assertions rather than considering different aspects and the relationship between them
Level 2	3–4	• Demonstrates some accurate knowledge and understanding, with only minor gaps or omissions • Some of the points made will be relevant to the context in the question, but the link will not always be clear • Displays a partially developed discussion which considers some different aspects and some consideration of how they interrelate, but not always in a sustained way

Level 3	5–6	• Demonstrates mostly accurate and thorough/detailed knowledge and understanding • Most of the points made will be relevant to the context in the question, and there will be clear links • Displays a well-developed and logical discussion which clearly considers a range of different aspects and considers how they interrelate, in a sustained way

Question Number	Answer	Mark
12	Award **one** mark for a correctly stated legal requirement: • Construction health & safety plan • Construction phase plan • Method statements • Risk assessments • Informing the Health & safety Executive • Liaison with the principal designer • Statutory notices Accept any other appropriate response.	(1)

Question Number	Answer	Mark
13	Award **one** mark for each correctly stated type of foundation, up to a maximum of **two** marks from: • Trench/mass fill • Raft • Pile • Pad Accept any other appropriate response. Do **not** accept wide strip or narrow strip	(2)

Question Number	Answer	Mark
14	Award **one** mark for each correct response, up to a maximum of **two** marks. • **B** – Tramways • **D** – Railways	(2)

Question Number	Answer	Mark
15	Award **one** mark for each type of pointing method, up to a maximum of **two** marks. • Bucket handle/tooled • Recessed • Weathered • Flush Accept any other appropriate response	(2)

Question Number	Answer	Mark
16	Award **one** mark for a correct identification of an advantage, and **one** mark for a justification (1), up to a maximum of **two** marks. • As they are flexible and porous (1) they can absorb substantial wave and wind energy (1) • Gabion walls resist breakage and separation (1) due to the flexibility of their wire mesh construction (1) • Gabions are aesthetically pleasing (1) and can blend in with the coastal environment (1) • The gravel and rocks used in gabion construction are natural to the environment (1) and can endure years of wear through water erosion (1) Accept any other appropriate response. Do **not** accept cost effective/cheap	(2)

Question Number	Answer	Mark
17	Award **one** mark for each identification of a reason why facing bricks are used for a new building development, and **one** mark for each justification of the reasons given, up to a maximum of **four** marks. • Facing bricks are durable and have good resistance to weather / freeze-thaw cycles (1) which means that the building will have a long life cycle / will not need to be repaired on a regular basis (1) • Facing bricks are available in a range of colours/textures/finished (1) which will allow the extension to blend in with the existing aesthetics of the school building (1) • Facing bricks are manufactured from clay (1) which is a natural material with an abundant/extensive/plentiful supply (1) Accept any other relevant phrasing/wording.	(4)

Question Number	Answer	Mark
18	Award **one** mark for each correct advantage of using a beam and block floor instead of a solid concrete floor, and **one** mark for each justification of why it is a benefit, up to a maximum of **four** marks. • Faster from of construction (1) as no hardcore/surface preparation/formwork required (1) • Reduced load on the foundation compared to a solid concrete floor (1) as it is overall lighter in weight (1) • No curing period is required for beam and block floors compared to solid concrete floors (1) so beam and block floors can be used/built from straight away (1) • Can be laid in all weathers (1) as everything is pre-cast (1) Accept any other appropriate response.	(4)

Question Number	Answer	Mark
19	Award **one** mark for a correct reason for using a strip foundation for a building project, **one** mark for a justification of the benefit, and **one** mark for an expansion of the justification, up to a maximum of **three** marks. • Cost effective foundation (1) due to its speedy form of construction (1) as a result of the need for reduced concrete requirements in the trench/trench support (1) • Simple form of construction/traditional well known method of construction (1) as it mostly does not require specialist plant (1) or formwork for the trench (1) • Appropriate for the relatively light loading of low-rise construction (1) where the building load can be spread over a relatively small footprint (1) when ground bearing capacity is good (1) Accept any other appropriate response.	(3)

Question Number	Answer	Mark
20	Award **one** mark for an identification of a correct way a cavity tray can reduce dampness on the internal skin of a cavity wall, **one** mark for a justification, and **one** mark for an expansion of the justification, up to a maximum of **three** marks. • The cavity tray collects moisture that forms within the cavity of the wall (1) which is diverted away from the inner wall due to the slope of the tray (1) through weep holes to the outside of the wall (1) • Cavity trays reduce the likelihood of lintels above windows/doors/openings from rusting/corroding (1) because they feature stop ends (1) that prevent water from running off their ends (1) • Cavity trays are a damp proof course (DPC) (1) made from an impervious/waterproof material (1) that prevents the passage of moisture to the internal leaf over openings/abutments of extensions (1) Accept any other appropriate response.	(3)

Question Number	Answer	Mark
21	Responses will be credited according to the learner's demonstration of knowledge and understanding of the material, using the indicative content and level descriptors below. The indicative content that follows is not prescriptive. Responses may cover some or all indicative content, but learners should be rewarded for other relevant responses. The learner's response should include the factors that may influence the developer's choice of structural form. The learner could discuss the increased speed of erection of modular frame forms, linked to meeting the business demands or a quicker return on the investment of the money invested by the developer and reduced time on site, resulting in less impact on the natural environment. The learner's discussion may include some of the points listed as to why the developer may prefer a modular frame form. • Speed of build-Modular building projects can be completed quicker than traditional construction methods. By choosing to build modular, the indoor construction process can take place alongside site and foundations work and there is reduced concern about weather delays. • Off-site Construction-Modular buildings are constructed off-site and are then brought to site ready to build. Ensuring better construction quality management, less on-site construction wastage and less disruption to the local and natural environment. • Environmentally friendly-Modular buildings may be built with eco-friendly building materials and may use recycled materials. Reduced construction time on site can potentially reduce carbon emissions from construction plant etc. • Cost-effective-Due to speed of erection as manufactured off-site and therefore a reduced need for skilled operatives to erect and construct buildings, compared to other forms, such as traditional masonry construction. • Aesthetics-Uses quality sustainable building materials, modular constructions can be an attractive pleasing to the eye. • Bespoke designs-Building could be tailored to blend in with other local buildings Modular buildings can be custom-made to fit exact space and budget requirements. • Durability of materials used-Modular buildings are constructed with the most durable building materials to ensure that the modular construction is built to last. • The materials used for internal walls can improve sound insulation and fire-proofing, and modular building structures can be extremely airtight which ensures their energy-efficiency.	(6)

	• Requires continuous internal vapour barrier to protect the frame from interstitial condensation	

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VAT Reg No GB 278 537121

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Publication code:
VQ000073